

**WHAT IS CLAIMED IS:**

1. A topical composition for treating microbes, in order to inhibit or prevent the growth on the skin or scalp of said microbes, comprising:

a) from about 0.001% to about 10%, by weight of the composition, of an anti-microbial active selected from the group consisting of polyvalent metal salts of pyrithione;

b) from about 0.001% to about 10%, by weight of the composition, of a metal ion source selected from group consisting of zinc salts, copper salts, silver salts, nickel salts, cadmium salts, mercury salts, bismuth salts, and mixtures thereof; and

c) a topical carrier for the anti-microbial active and the metal salt;

wherein the weight ratio of the metal source to the anti-microbial active is from about 5:100 to about 5:1 and wherein at least 50% of the anti-microbial active is insoluble in the composition.

2. A topical composition according to Claim 1, wherein the polyvalent metal salt of pyrithione is selected from the group consisting of magnesium pyrithione, barium pyrithione, bismuth pyrithione, strontium pyrithione, copper pyrithione, zinc pyrithione, cadmium pyrithione, zirconium pyrithione and mixtures thereof.

3. A topical composition according to Claim 2, wherein the polyvalent metal salt of pyrithione is selected from the group consisting of zinc pyrithione, copper pyrithione, and mixtures thereof.

4. A topical composition according to Claim 3, wherein the polyvalent metal salt of pyrithione is zinc pyrithione.

5. A topical composition according to Claim 4, wherein the composition comprises from about 0.1% to about 2%, by weight of the composition, of the zinc pyrithione.

6. A topical composition according to Claim 1, wherein the metal ion source is selected from the group consisting of zinc acetate, zinc oxide, zinc carbonate, zinc hydroxide, zinc chloride, zinc sulfate, zinc citrate, zinc fluoride, zinc iodide, zinc lactate, zinc oleate, zinc oxalate, zinc phosphate, zinc propionate, zinc salicylate, zinc selenate, zinc silicate, zinc stearate, zinc sulfide, zinc tannate, zinc tartrate, zinc valerate, zinc gluconate, zinc undecylate, copper disodium citrate, copper triethanolamine, copper carbonate, cuprous ammonium carbonate, cupric hydroxide, copper chloride, cupric chloride, copper ethylenediamine complex, copper oxychloride, copper oxychloride sulfate, cuprous oxide, copper thiocyanate, colloidal silver, silver bromide, silver chloride, silver citrate, silver iodide, silver lactate, silver nitrate, silver oxide, silver picrate, and mixtures thereof.

7. A topical composition according to Claim 1, wherein the metal ion source is selected from the group consisting of zinc salts, copper salts and mixtures thereof.

8. A topical composition according to Claim 7, wherein the metal ion source is selected from the group consisting of soluble zinc salts, soluble copper salts, and mixtures thereof.

9. A topical composition according to Claim 8, wherein the metal ion source is selected from copper sulfate, zinc sulfate, and mixtures thereof.

10. A topical composition according to Claim 7, wherein the composition comprises from about 0.1% to about 2%, by weight of the ~~composition~~, of the metal ion source.

11. A topical composition according to Claim 1 wherein at least 99.99% of the anti-microbial active is insoluble in the composition.

12. A topical composition according to Claim 1, wherein 100% of the anti-microbial active is insoluble in the composition.

13. A topical composition according to Claim 1, wherein less than 50% of the polyvalent metal salt disassociates into free pyrrhione ion in the composition.

14. A topical composition according to Claim 13, wherein less than 5% of the polyvalent metal salt disassociates into free pyrrithione ion in the composition.

15. A topical composition according to Claim 1, wherein the composition comprises at least a 5 to 1 ratio of polyvalent metal salt of pyrrithione to strong chelating agent.

16. A topical composition according to Claim 1, wherein the composition is free of strong chelating agents.

17. A topical composition according to Claim 1, wherein the composition further comprises from about 7% to about 30%, by weight of the composition, of a deterative surfactant selected from the group consisting of anionic surfactants, amphoteric surfactants, zwitterionic surfactants, and mixtures thereof.

18. A topical composition according to Claim 17 wherein the deterative surfactant is an anionic surfactant.

19. A topical composition according to Claim 1, wherein the composition further comprises a conditioning agent.

20. A topical composition according to Claim 1, wherein the composition further comprises a cationic styling polymer and a cationic deposition polymer.

21. A topical composition according to Claim 1, wherein the composition is a hair styling shampoo and wherein the composition further comprises a cationic spreading agent.

22. A topical composition according to Claim 1, wherein the composition further comprises a polyalkylene glycol.

23. A topical composition according to Claim 1, wherein the composition further comprises an additional anti-microbial active selected from the group consisting of ketaconazole, intraconazole, coal tar, selenium sulfide, and mixtures thereof.

24. A topical composition according to Claim 1, wherein the composition further comprises a hair growth active.

25. A topical composition according to Claim 19, wherein the conditioning agent is selected from the group consisting of cationic polymers, polyolefins, hydrocarbon oils, silicone gums, silicone oils, and mixtures thereof.

26. ~~A topical anti-dandruff composition comprising:~~

- 26*
- ~~a) from about 0.1% to about 2%, by weight of the composition, of zinc pyrithione;~~
  - ~~b) from about 0.01% to about 5%, by weight of the composition, of a metal ion source useful for increasing efficacy of zinc pyrithione selected from the group consisting of zinc salts, copper salts, silver salts, nickel salts, cadmium salts, mercury salts, bismuth salts;~~
  - ~~c) a topical carrier for said zinc pyrithione and said metal ion source.~~

~~wherein the weight ratio of the metal source to the anti-microbial active is from about 5:100 to about 5:1 and wherein at least 50% of the zinc pyrithione is insoluble in the composition.~~

27. An anti-dandruff composition according to Claim 26, wherein the metal ion source is selected from zinc acetate, zinc oxide, zinc carbonate, zinc hydroxide, zinc chloride, zinc sulfate, zinc citrate, zinc fluoride, zinc iodide, zinc lactate, zinc oleate, zinc oxalate, zinc phosphate, zinc propionate, zinc salicylate, zinc selenate, zinc silicate, zinc stearate, zinc sulfide, zinc tannate, zinc tartrate, zinc valerate, zinc gluconate, zinc undecylate, copper disodium citrate, copper triethanolamine, copper carbonate, cuprous ammonium carbonate, cupric hydroxide, copper chloride, cupric chloride, copper ethylenediamine complex, copper oxychloride, copper oxychloride sulfate, cuprous oxide, copper thiocyanate, colloidal silver, silver chloride, silver citrate, silver iodide, silver lactate, silver nitrate, silver oxide, silver picrate, and mixtures thereof.

28. ~~A shampoo composition useful for improving the appearance of scalp exhibiting dandruff symptoms, said composition comprising:~~

- 28*
- ~~a) from about 0.3% to about 2%, by weight of the composition, of zinc pyrithione;~~
  - ~~b) from about 0.01% to about 5%, by weight of the composition, of a metal ion source selected from the group consisting of zinc acetate, zinc oxide, zinc~~

36. A topical anti-microbial composition prepared by the process of mixing:

a) from about 0.1% to about 2%, by weight of the composition, of an anti-microbial active selected from the group consisting of polyvalent metal salts of pyrithione;

b) from about 0.01% to about 5%, by weight of the composition, of a metal ion source selected from group consisting of zinc salts, copper salts, silver salts, nickel salts, cadmium salts, mercury salts, bismuth salts, and mixtures thereof; and

c) a topical carrier for the anti-microbial active and the metal salt.

wherein the weight ratio of the metal source to the anti-microbial active is from about 5:100 to about 5:1 and wherein at least 50% of the anti-microbial active is insoluble in the composition.

37. A topical anti-microbial composition according to Claim 36 wherein the polyvalent metal salt is zinc pyrithione and the metal ion source is selected from the group consisting of zinc salts, copper salts, and mixtures thereof.

38. A topical anti-microbial composition according to Claim 37 wherein at least 99.9% of the anti-microbial active is insoluble in the composition.

add A1  
add B1

add  
C2

add  
D6

carbonate, zinc hydroxide, zinc chloride, zinc sulfate, zinc citrate, zinc fluoride, zinc iodide, zinc lactate, zinc oleate, zinc oxalate, zinc phosphate, zinc propionate, zinc salicylate, zinc selenate, zinc silicate, zinc stearate, zinc sulfide, zinc tannate, zinc tartrate, zinc valerate, zinc gluconate, zinc undecylate, copper disodium citrate, copper triethanolamine, copper carbonate, cuprous ammonium carbonate, cupric hydroxide, copper chloride, cupric chloride, copper ethylenediamine complex, copper oxychloride, copper oxychloride sulfate, cuprous oxide, copper thiocyanate, and mixtures thereof;

- c) a topical carrier for said zinc pyrithione and said metal ion source; and
- d) a deterative surfactant;

wherein the weight ratio of the metal source to the anti-microbial active is from about 5:100 to about 5:1 and wherein at least 50% of the zinc pyrithione is insoluble in the composition.

29. A topical composition according to Claim 1 wherein the composition further comprises a solid cosmetic carrier.

30. A topical composition according to Claim 29 wherein the solid cosmetic carrier is talc.

31. A method of treating athlete's foot comprising the application of a safe and effective amount of the topical composition of Claim 1 to the feet of a person in need of such treatment.

32. A method of treating microbial infections comprising applying to the skin of mammal in need of treatment a safe and effective amount of the composition of Claim 1.

33. A method of improving the appearance of hair or scalp, said method comprising the steps of topically applying to hair or scalp in need of treatment a composition according to Claim 4.

34. A method of treating fungal infections on the skin or scalp comprising applying to the scalp of mammal in need of treatment a safe and effective amount of the composition of Claim 26.

35. A method of treating dandruff comprising applying to the scalp of mammal in need of treatment a safe and effective amount of the composition of Claim 13.